PENTAIR

Raychem NGC-40 Hardware Manager

USER MANUAL

INSTALL-193

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Section – 1 INTRODUCTION

1.1 Welcome

This manual provides instructions for use of the Raychem NGC-40 Hardware Manager software. This software provides the ability to manage communications parameters and firmware updates for NGC-40 Heat-Tracing Controllers and other NGC-40 devices.

1.2 Technical Support

For technical support, contact the Technical support group at (800) 545-6258 or email: PTM-techsupport@pentair.com

1.3 System Requirements

The following equipment will be necessary to use the firmware upgrade and parameter upload utilities presented in this manual.

- A mouse or other compatible pointing device
- Microsoft Windows® XP Pro and Windows XP Home
- Network connectivity

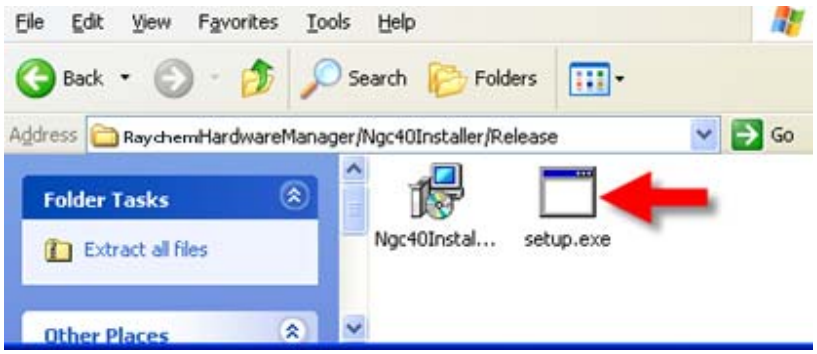
Section – 2 INSTALLING THE RAYCHEM NGC-40 HARDWARE MANAGER

2.1 Downloading the software

The Raychem NGC-40 Hardware Manager software may be installed from the G:\Engineering\NGC-40 Product folder. Installing the software on your computer will require administrative rights which can be obtained from IT.

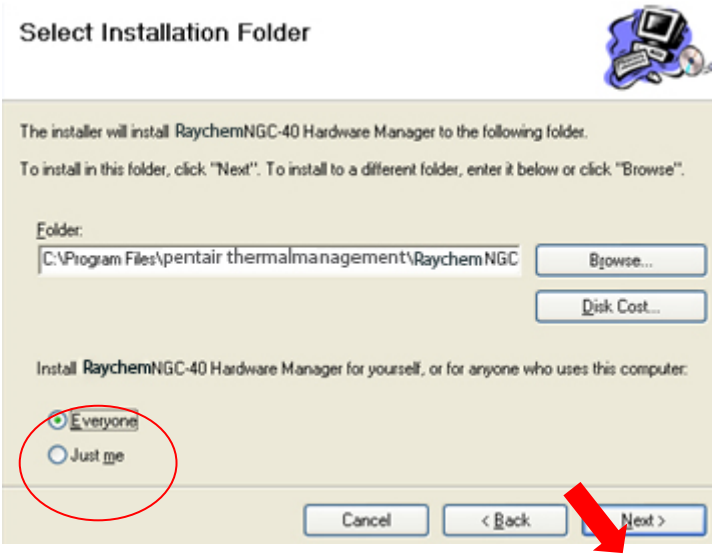
2.2 Installing the Software on Your Computer

To install the Raychem NGC-40 Hardware Manager software to your computer, open the hardware manager folder and double-click on the setup.exe icon as shown below.

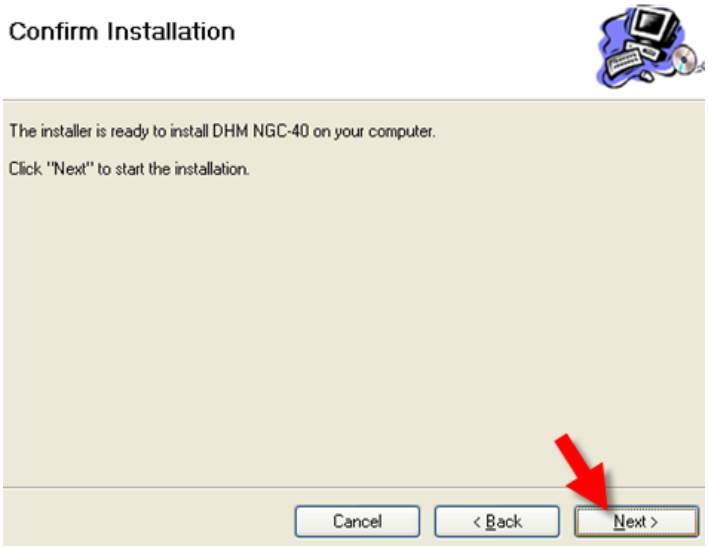


This will initiate the setup process. The first screen will confirm the program file location.

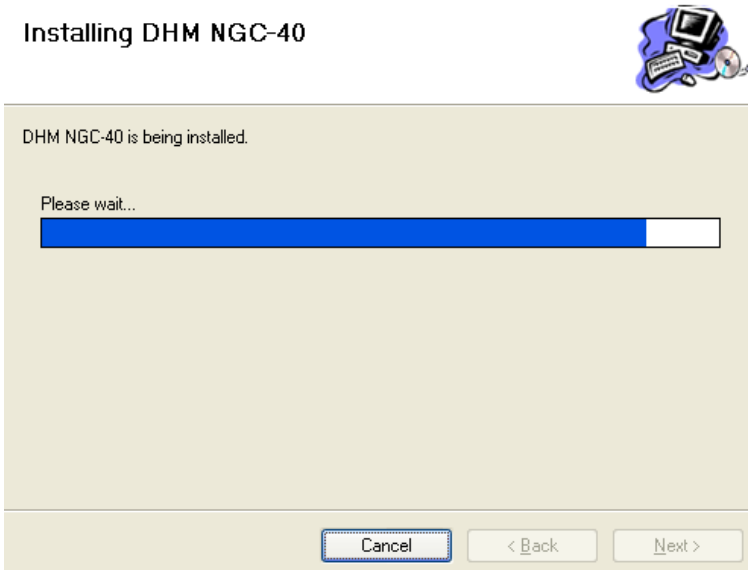
At the bottom of the window is an option for allowing access to the program. Select "Everyone" to allow all users to access the DHM NGC-40 program.


Select Installation Folder
The installer will install RaychemNGC-40 Hardware Manager to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\Program Files\pentair thermalmanagement\Raychem NGC
Browse...
Disk Cost...
Install RaychemNGC-40 Hardware Manager for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >

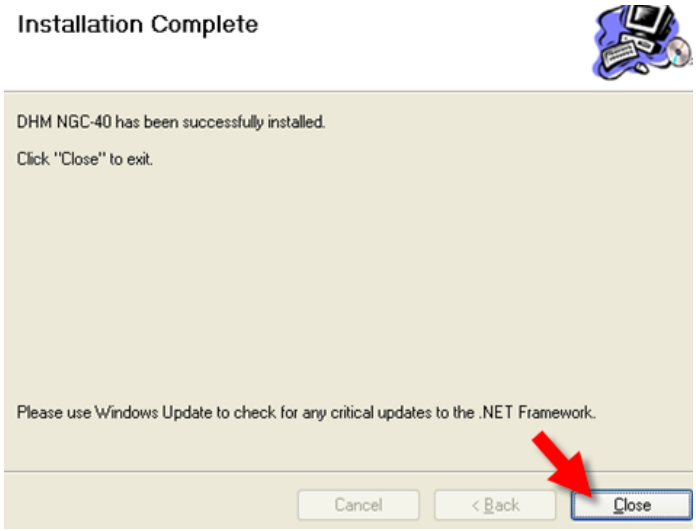
When the file location and access options have been selected, press the Next button to continue installation.


Confirm Installation
The installer is ready to install DHM NGC-40 on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >

Wait for the program to install. The progress is shown by a bar graph.

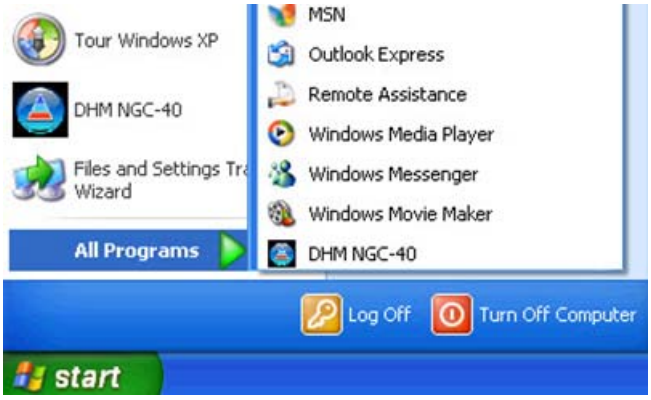


Installation is now complete. Select the Close button to close the installer.
The Raychem NGC-40 Hardware Manager software is now available to use.


Installation Complete
DHM NGC-40 has been successfully installed.
Click "Close" to exit.
Please use Windows Update to check for any critical updates to the .NET Framework.
Cancel
< Back
Close

During installation a program icon will be placed on your desktop. Double-click this icon to open the Raychem NGC-40 Hardware Manager.

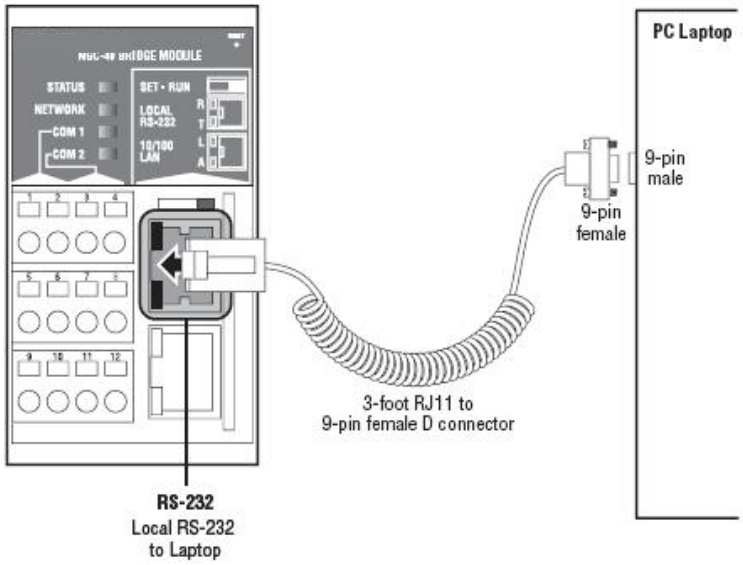
The program can also be accessed from the Start Menu. Select the Start button in the bottom left corner of the windows desktop, then All Programs, then DHM NGC-40.



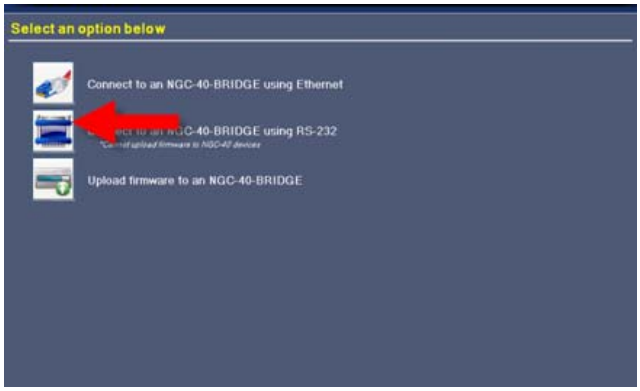
Section – 3 CONNECTING TO THE RAYCHEM NGC-40 SYSTEM

3.1 Connecting via RS-232

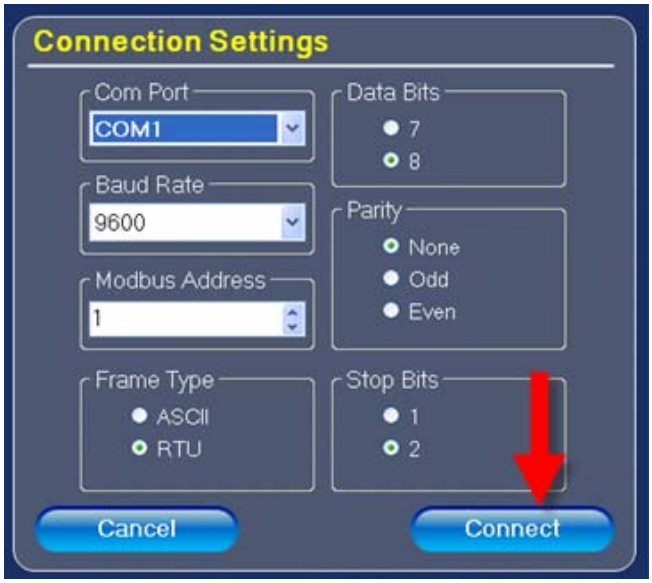
Ensure that the NGC-40-BRIDGE in the panel is connected to your computer via the RS-232 port on the front of the NGC-40-BRIDGE module. The NGC-40 Bridge COM 3 port is an RS-232 port and can be connected directly to the computer with a cable. If a patch cable is not available, it can be ordered using part number 10332-005.



Open Raychem NGC-40 Hardware Manager and click on the icon to connect to an NGC-40-BRIDGE using RS-232.



The connection settings screen will appear. Confirm that the Com port matches your PC Com port and the Modbus® Address matches the NGC-40-BRIDGE you are connecting to and then press the Connect button.



Com Port – specifies which port on the computer is physically connected to the NGC-40-BRIDGE. Default setting is Com1

Baud Rate – indicates the speed of data transmission. Default setting is 9600

Modbus Address – address of the NGC-40-BRIDGE you are connecting to. Normally this is set to 1

Data Bits, Parity, Stop Bits and **Frame Rate** settings are all used to indicate the length and type of packets being sent between the PC and the NGC-40-BRIDGE. Default settings are, 8 data bits, no Parity, 2 stop bits and RTU frame type.

Ensure that the settings here are consistent with the communication parameters in the NGC-40-BRIDGE for the COM port being used. Inconsistencies may result in communication failures. If you are having difficulty connecting to the NGC-40-BRIDGE, change the NGC-40-BRIDGE to "Set" mode. The above default settings will be used and override any current bridge communications configuration.

Once you have successfully connected to the NGC-40-BRIDGE you will see the following screen:

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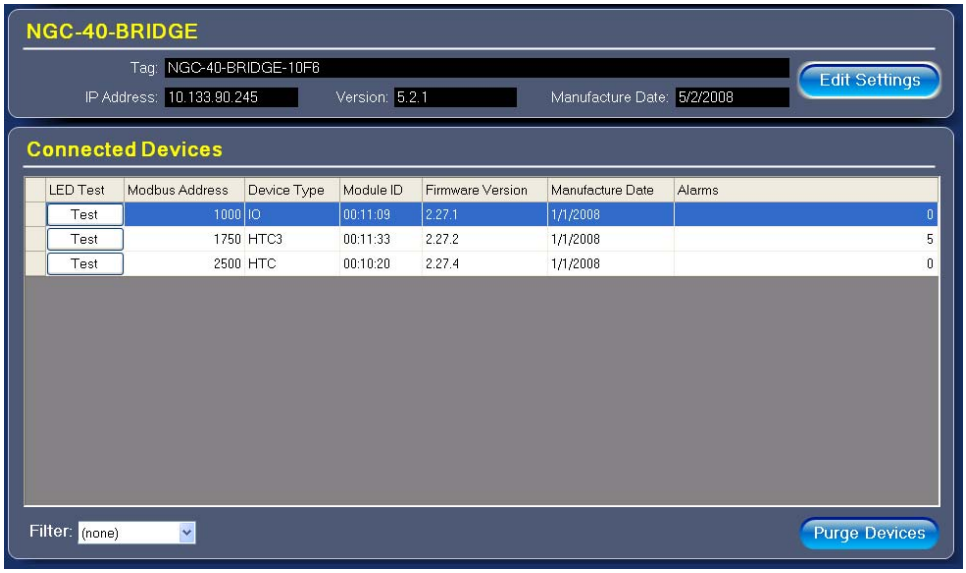


The top portion of the screen shows the NGC-40-BRIDGE information. The NGC-40-BRIDGE Tag is a short name that can be given to a module for easy recognition

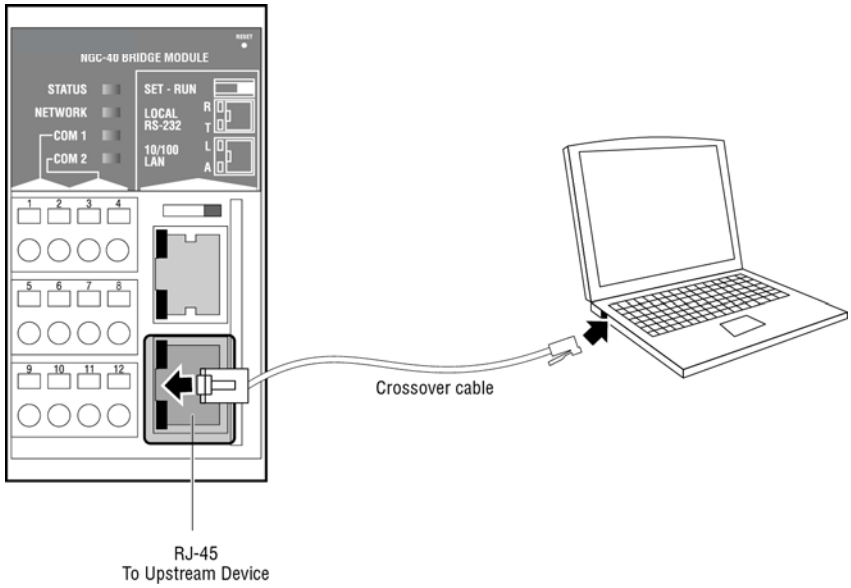
To change the NGC-40-BRIDGE communications parameters go to Section 3.3 – Configuration of the NGC-40-BRIDGE

To load firmware into the NGC-40 devices go to Section 4.4 – Upload Firmware to a NGC-40 Module. **You must connect to the NGC-40-BRIDGE using the Ethernet connection to load new firmware.**

3.2 Connecting via Ethernet

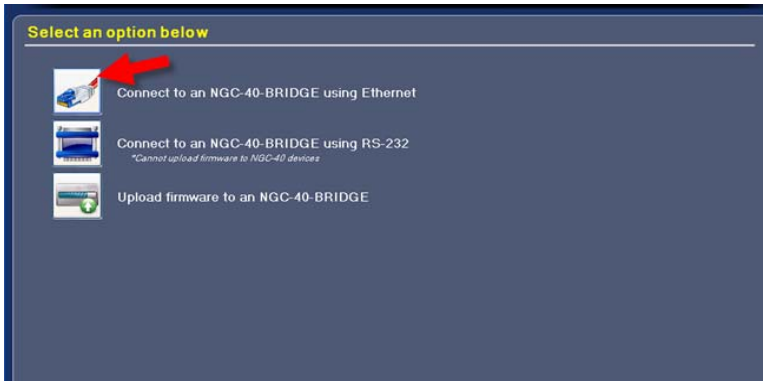
If you know the IP address of the NGC-40-BRIDGE, you can connect your PC to the NGC-40-BRIDGE using the Ethernet connection. If you do not know the IP, you must use the RS-232 connection method.

First ensure that the NGC-40-BRIDGE in the panel is connected to your computer via the Ethernet port on the front of the NGC-40-BRIDGE module.

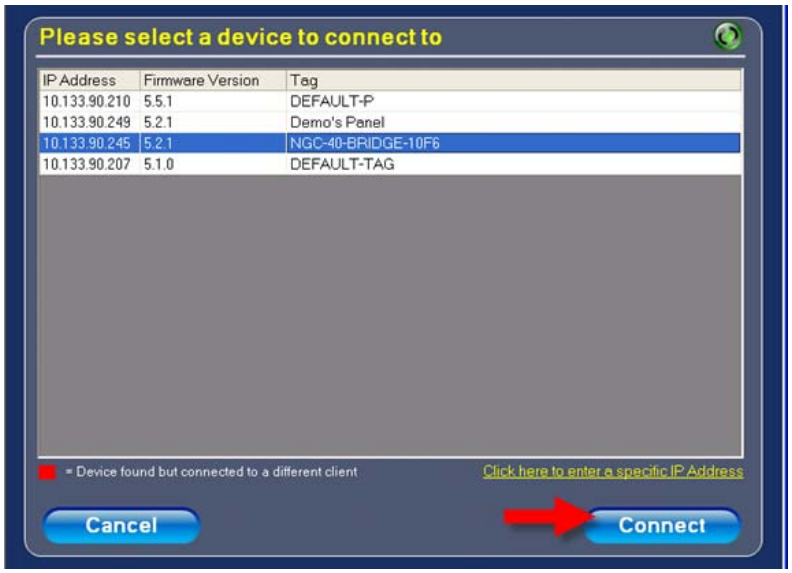


Set your computer IP so that it is in the same network as the NGC-40-BRIDGE module. (i.e. if the NGC-40-BRIDGE IP is 192.168.1.100, your computer IP should be 192.168.1.XXX, where XXX is a different number than that used in the NGC-40-BRIDGE). For help with this setup, contact your local IT resource or product marketing.

Open Raychem NGC-40 Hardware Manager and click on the icon to connect to an NGC-40 NGC-40-BRIDGE using Ethernet.

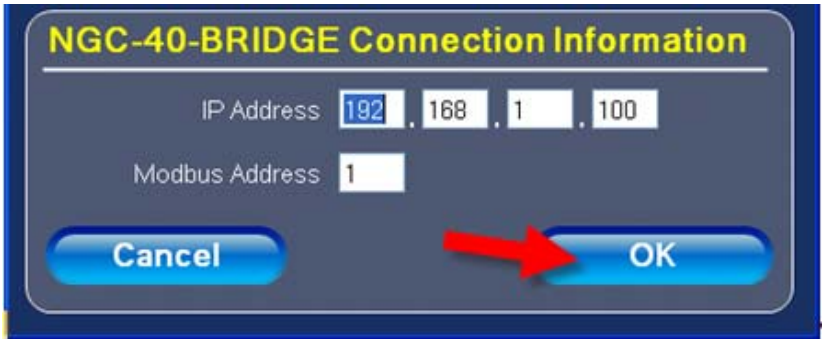

Select an option below
Connect to an NGC-40-BRIDGE using Ethernet
Connect to an NGC-40-BRIDGE using RS-232
*Cannot upload firmware to NGC-40 devices
Upload firmware to an NGC-40-BRIDGE

The program will automatically detect the NGC-40-BRIDGE module and display it in on screen. Select the appropriate NGC-40-BRIDGE module from the list provided and press the Connect button.



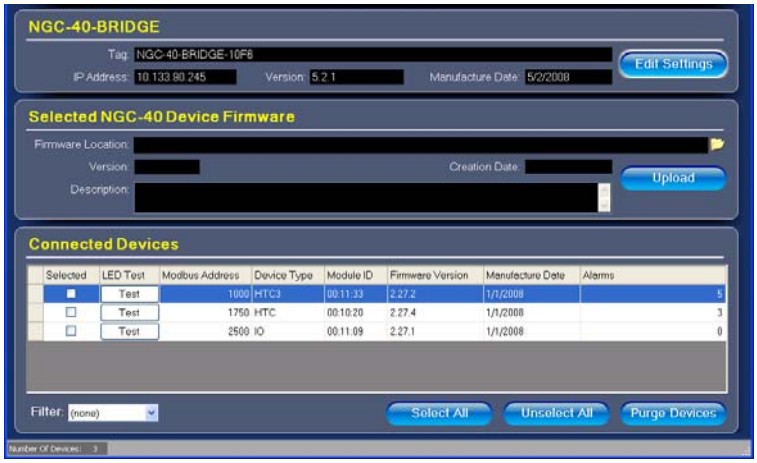
If the NGC-40-BRIDGE you are trying to connect to is not displayed and you know the IP address of the NGC-40-BRIDGE module, there is an option to manually enter the IP address. Select "Click here to enter a specific IP Address".

A window will appear. Enter the IP Address of the desired NGC-40-BRIDGE and select OK.



The top right corner has a refresh button that allows you to scan the Ethernet network again for NGC-40-BRIDGE modules that may not be picked up at first.

The Raychem NGC-40 Hardware Manager is now connected to the NGC-40-BRIDGE and all NGC-40 modules currently connected to that NGC-40-BRIDGE will be listed as shown in the image below.

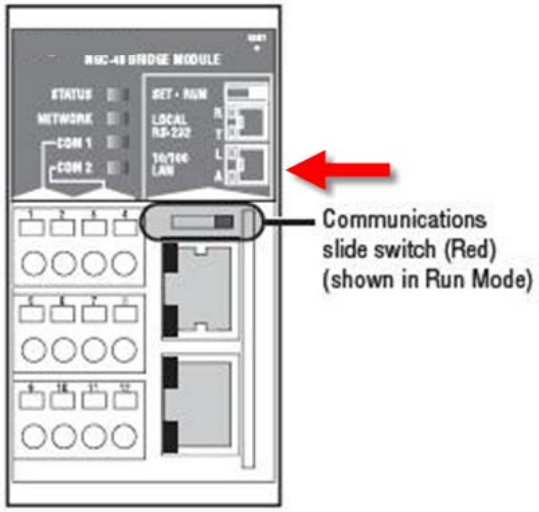


The top portion of the screen shows the NGC-40-BRIDGE information. The NGC-40-BRIDGE Tag is a short name that can be given to a module for easy recognition.

3.3 Configuration of the NGC-40-BRIDGE

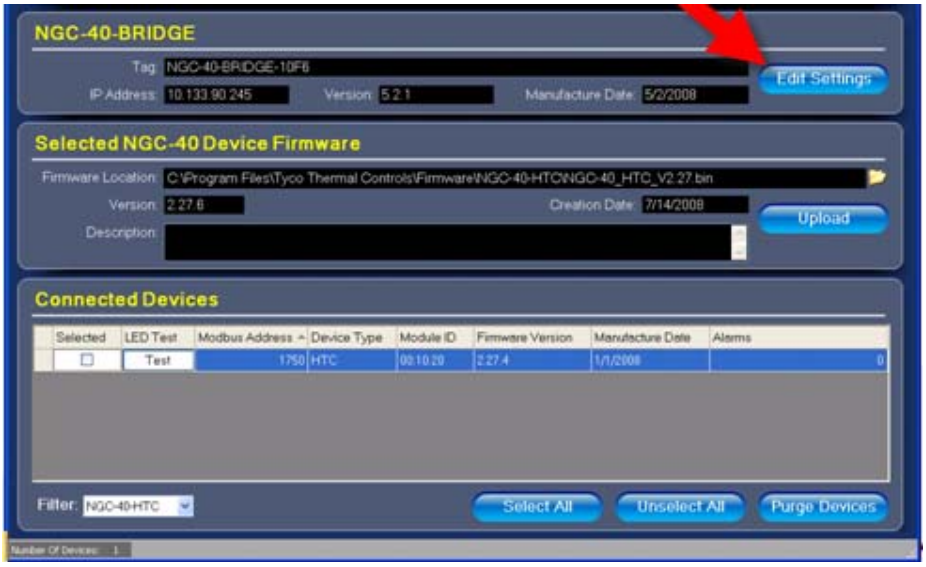
This section covers the communications and NGC-40-BRIDGE tag setup using the "Edit Settings" function in the DHM software. If you want to view the settings in read-only you can leave the NGC-40-BRIDGE in RUN mode. If you would like to change the settings, you must put the NGC-40-BRIDGE in SET mode.

(SET mode has slide switch to the left, RUN mode has switch to the right)



Select the desired NGC-40-BRIDGE mode, RUN or SET,

To access the configuration information, select "Edit Settings".



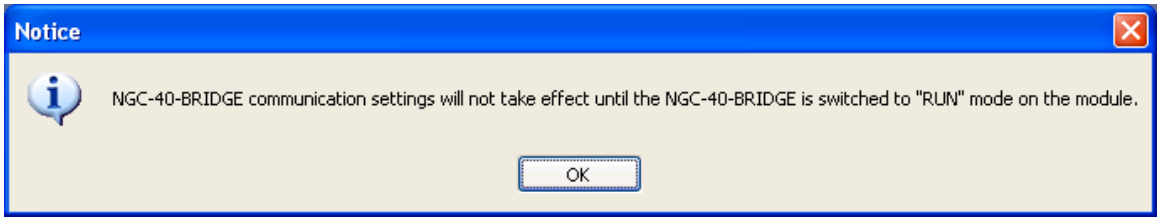
The Edit Settings screen includes all the communication parameters for the NGC-40-BRIDGE, including the settings for each COM port, as well as the Ethernet communication settings. The user can also enter up to 40 characters as a NGC-40-BRIDGE Tag, to more easily identify which NGC-40-BRIDGE they are connected to.

You will see a popup text when you enter the configuration screen. The popup will differ based on the NGC-40-BRIDGE mode:

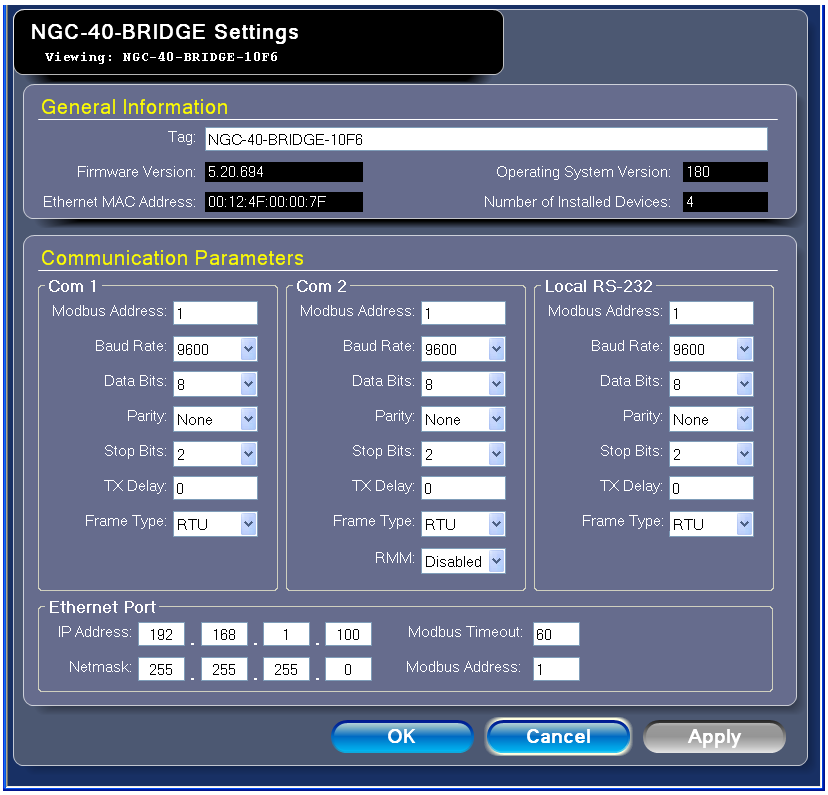
If the switch is in RUN mode:

Notice
NGC-40-BRIDGE should be changed to "SET" mode if you wish to change any of the communication parameters. Currently the NGC-40-BRIDGE is in "RUN" mode so you may only view the communication settings.
OK

If the switch is in SET mode:


Notice
NGC-40-BRIDGE communication settings will not take effect until the NGC-40-BRIDGE is switched to "RUN" mode on the module.
OK

IMPORTANT: After making changes to the communication parameters the RUN/SET switch MUST be returned to RUN mode for the changes to take effect.



Most of the General Information fields are read-only and are shown to provide more information about the NGC-40-BRIDGE.

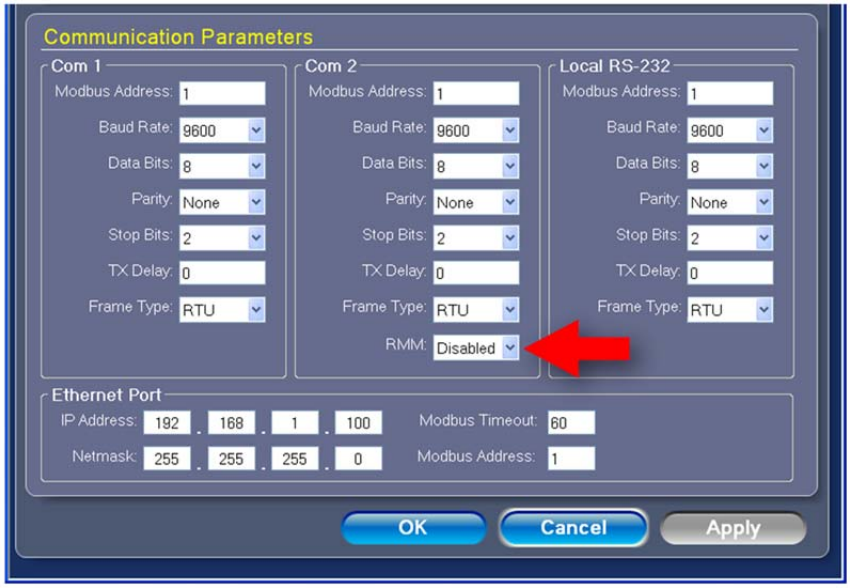
Firmware Version - shows which version is currently installed in the NGC-40-BRIDGE. This can be updated with DHM NGC-40 by selecting "Upload Firmware to an NGC-40-BRIDGE" from the main screen.

Ethernet MAC Address - is a unique address used for communications over Ethernet. This value cannot be changed.

Operating System Version - shows which OS is currently being run in the NGC-40-BRIDGE. This value also cannot be changed.

Number of Installed Devices - shows how many modules are currently being monitored by the NGC-40-BRIDGE. This number includes all devices that are stored in memory, even if they are no longer connected or not communicating properly.

Fields shown in white can be edited, and fields in black are read-only. Changes to the NGC-40-BRIDGE tag can be made any time, but changes to the communication parameters can only be made if the RUN/SET switch is in the SET position. Upon entering the "Edit Settings" screen, the program will detect the position of the RUN/SET switch and display a message.
Each COM Port has its own set of parameters. Each COM Port being used must have a Modbus Address that is different from the other devices that are on the same network. The valid range is 1-



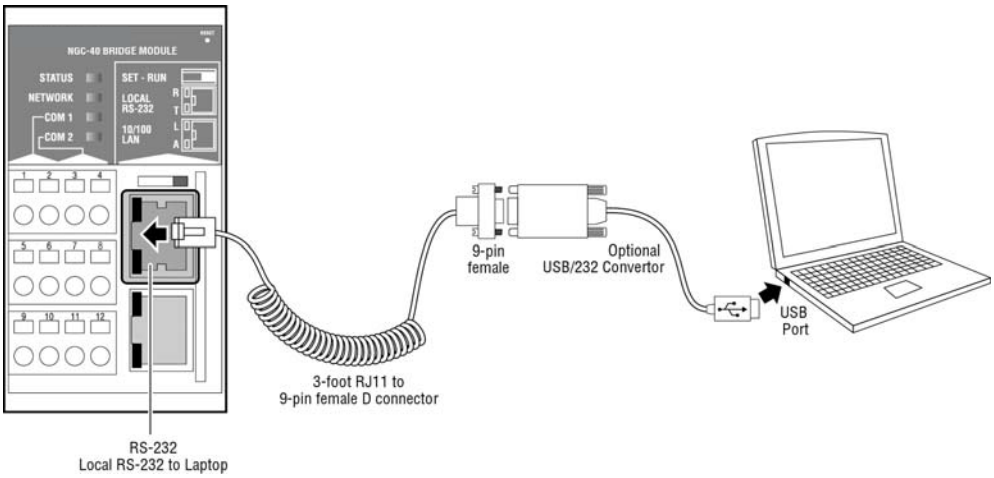
247. It is suggested that you record this address either on the module, or in a visible location within the panel.

Ensure that the settings for Baud Rate, Data Bits, Parity, Stop Bits and Frame Type are consistent between NGC-40-BRIDGE and the device that is being connected to that COM Port. Inconsistencies can cause communication failures. If an RMM (Remote Monitoring Module) is intended to be used with the NGC-40-BRIDGE, the Com 2 field "RMM" must be set to "Enabled". While "Enabled", all Com 2 parameters are ignored except for "TX Delay".

The default settings are shown in the picture above.

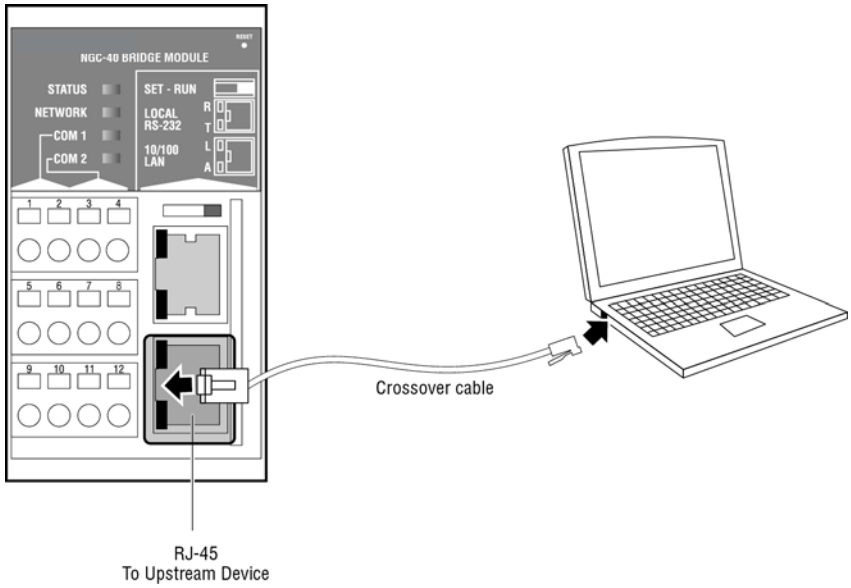
COM 1 and COM 2 are the RS-485 ports and Com 3 is the RS-232 port. Refer to the diagrams below for the proper connection techniques.

Connecting via RS-232:



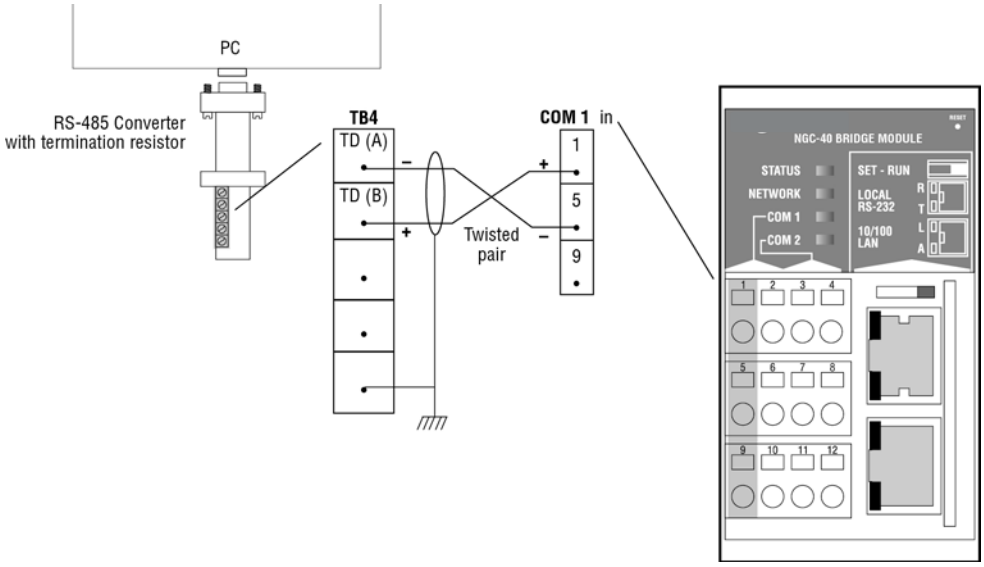
The COM 3 port is an RS-232 port and can be connected directly to the computer with a cable. If a serial port is not installed on your computer, you will need to order a USB/RS-232 converter. This converter will connect between your computers' USB port and the NGC-40-BRIDGE 9-pin serial cable.

Connecting via Ethernet:



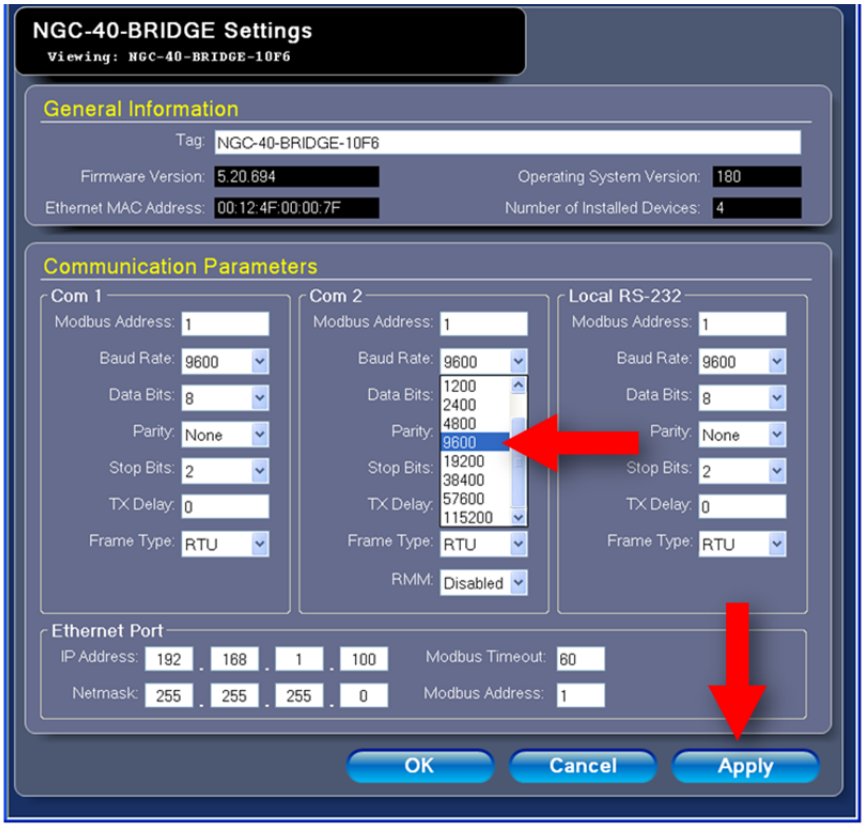
The Ethernet port can be connected to any Ethernet upstream devices.

COM1, COM 2 – RS-485

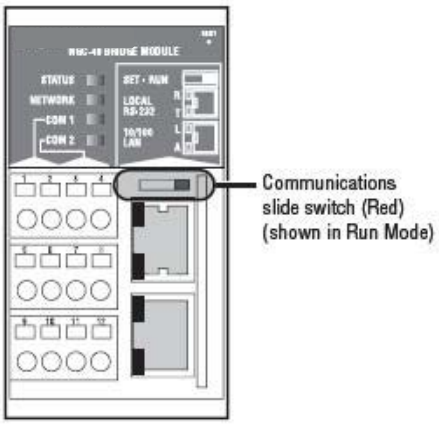


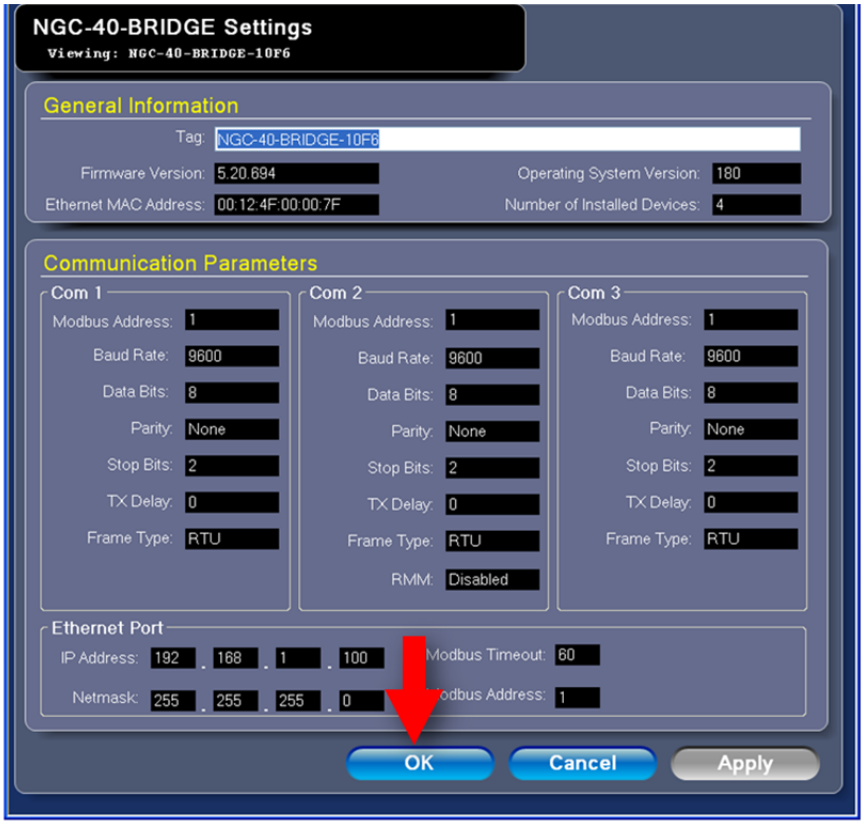
Wires are connected to COM 1 or COM2 via an RS-485/RS-232 converter, and from there to a computer.

After all the desired changes have been made, press the APPLY button to save the changes or OK to save and exit.



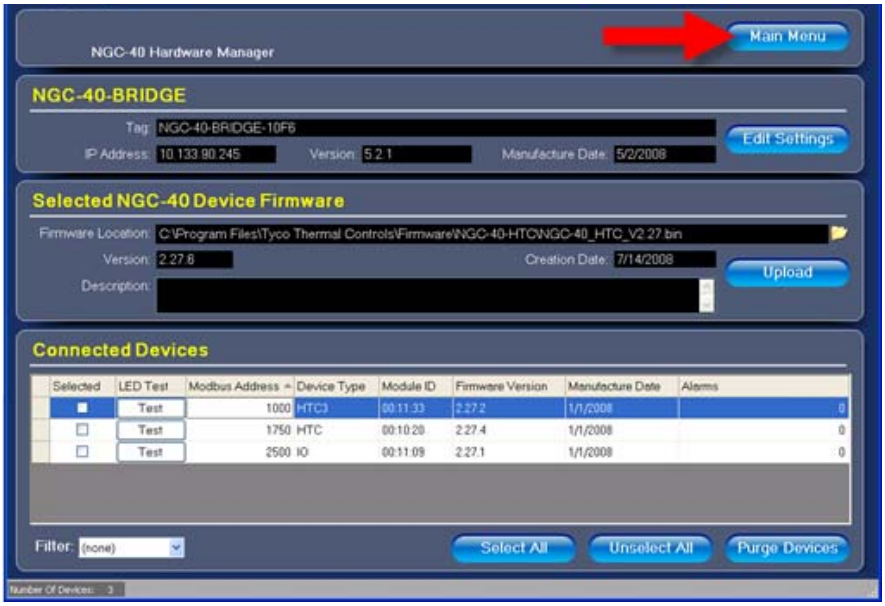
If you are done making changes, return the switch to RUN mode. All the communication parameter changes will be implemented. You can access the "Edit Settings" again to confirm the changes; all fields will now be black.





Press the OK button to return to the Connection screen.

If all configuration changes have been made, you can return to the main screen by pressing the Main Menu button.

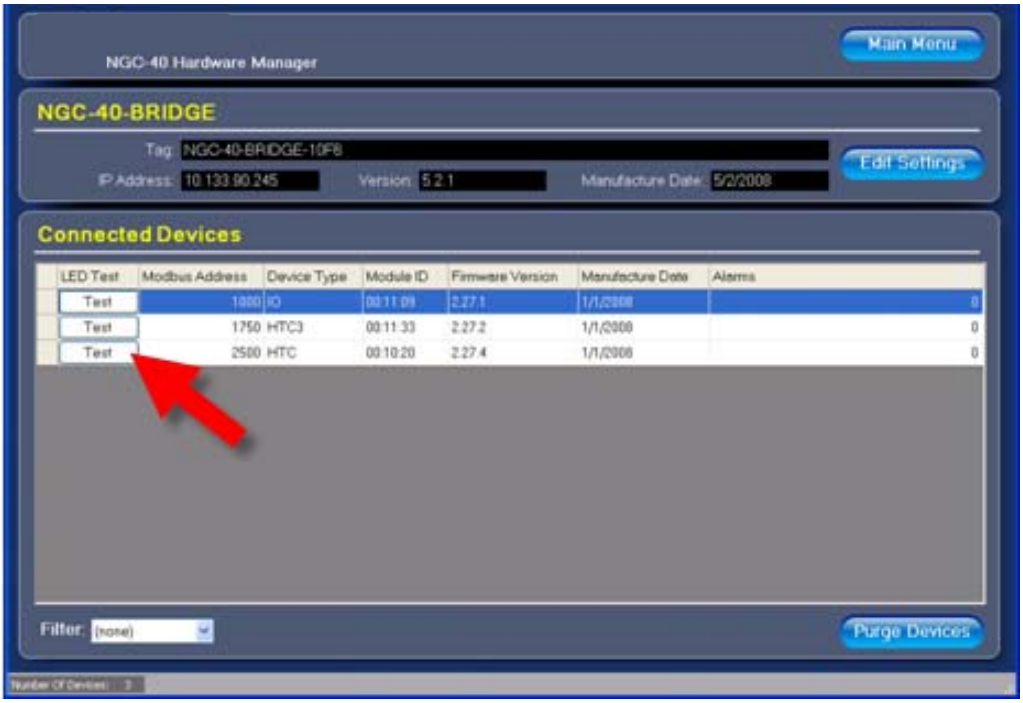


Section – 4 WORKING WITH CONNECTED DEVICES

Once you are connected to the NGC-40-BRIDGE via Ethernet or RS-232, you can perform some basic functions and gather information about the modules on the CAN network.

4.1 Identifying Connected Devices

The Test button shown next to each module will cause that module to execute an LED display test and all other modules' LED's to turn off. Each LED of the module under test will flash in sequence. This can be used to quickly identify the module in a panel, or for testing the LEDs.



Modbus Address - the address of the particular module. Each module will have a unique address

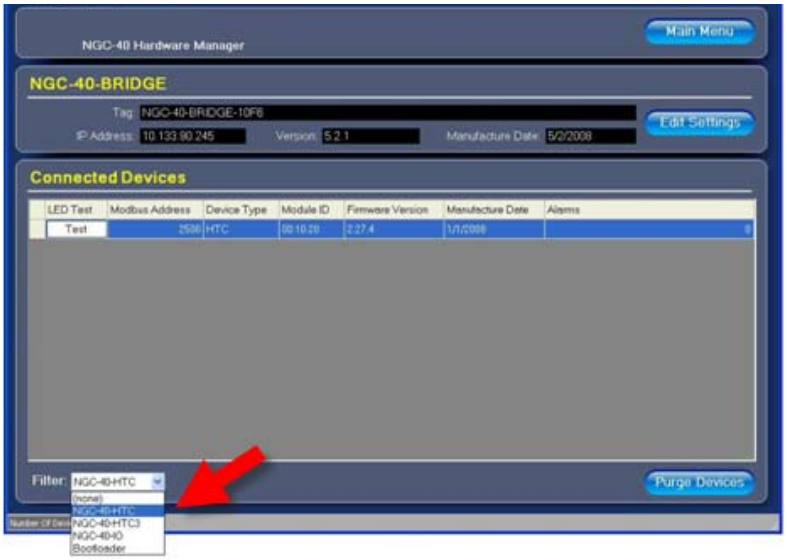
Device Type – Displays the NGC-40 module type (IO, HTC, HTC3)

Module ID – the unique CAN ID number used to identify each module in hexadecimal format.

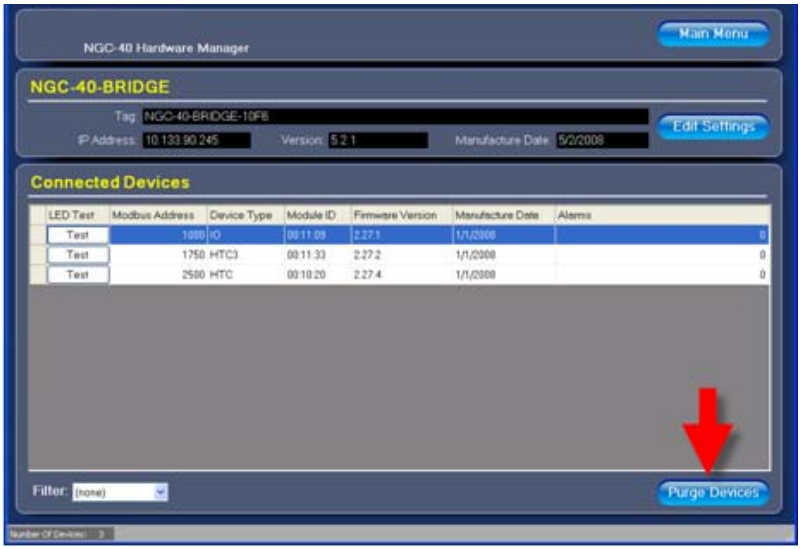
Firmware Version – the current version installed on each module.

Manufacture date - the date that the module was manufactured.

The information in each column can be sorted in ascending or descending order by clicking the field header.
The Filter option on the bottom left of the screen can also be used to filter the list to show only one type of controller.



The Purge Devices button will purge all modules out of the NGC-40-BRIDGE memory. All modules displayed in the list will disappear momentarily, after about 30 seconds a new module list will be displayed with the active CAN devices. This step may be required if you are installing an NGC-40-BRIDGE with an existing module list, or if you have removed modules from the network.

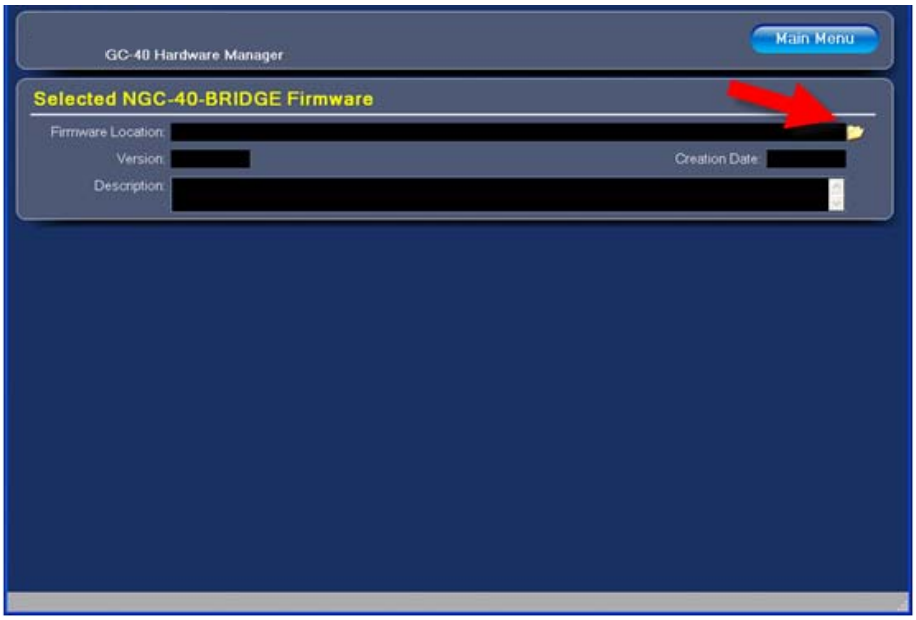

NGC-40 Hardware Manager
Main Menu
NGC-40-BRIDGE
Tag: NGC-40-BRIDGE-10F8
IP Address: 10.133.90.245
Version: 5.2.1
Manufacture Date: 5/2/2008
Edit Settings
Connected Devices
LED Test
Modbus Address
Device Type
Module ID
Firmware Version
Manufacture Date
Alarms
Test 1000 IO 00.11.09 2.27.1 1/1/2008 0
Test 1750 HTC3 00.11.33 2.27.2 1/1/2008 0
Test 2500 HTC 00.10.20 2.27.4 1/1/2008 0
Filter: (none)
Purge Devices

4.2 Upload Firmware to an NGC-40-BRIDGE

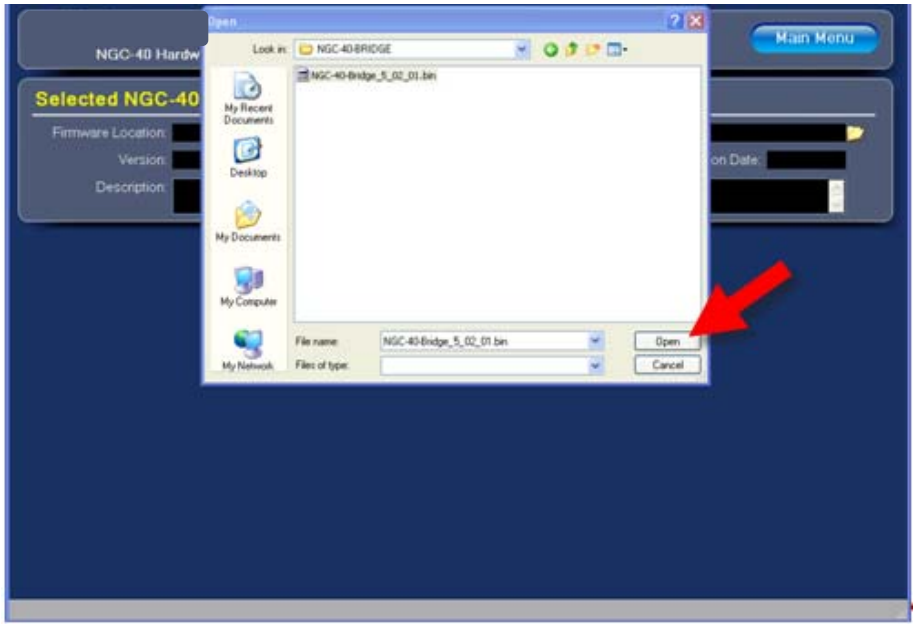
IMPORTANT – This process can only be performed when you connect to the NGC-40-BRIDGE via Ethernet.

From the DHM NGC-40 main screen select "Upload Firmware to an NGC-40-BRIDGE".

When this screen is initially opened the NGC-40-BRIDGE will not appear. First, choose the firmware file to upload. Select the folder beside Firmware Location.

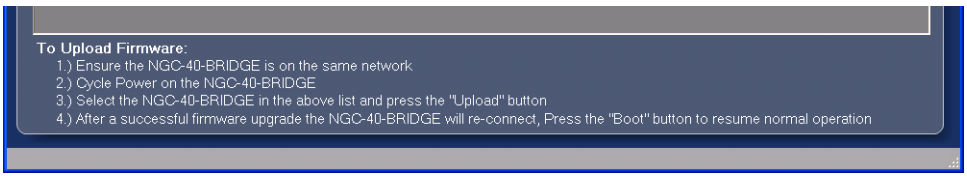


A file selection window will open. Select the proper file and Open it.



Information about the version of NGC-40-BRIDGE firmware selected will appear on the top of the screen.

At the bottom of the screen the following steps for uploading the firmware will be shown:

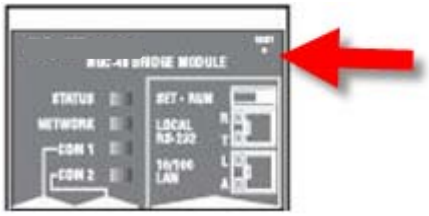

To Upload Firmware:
1.) Ensure the NGC-40-BRIDGE is on the same network
2.) Cycle Power on the NGC-40-BRIDGE
3.) Select the NGC-40-BRIDGE in the above list and press the "Upload" button
4.) After a successful firmware upgrade the NGC-40-BRIDGE will re-connect, Press the "Boot" button to resume normal operation

Step 1 – Ensure the NGC-40-BRIDGE is on the same network

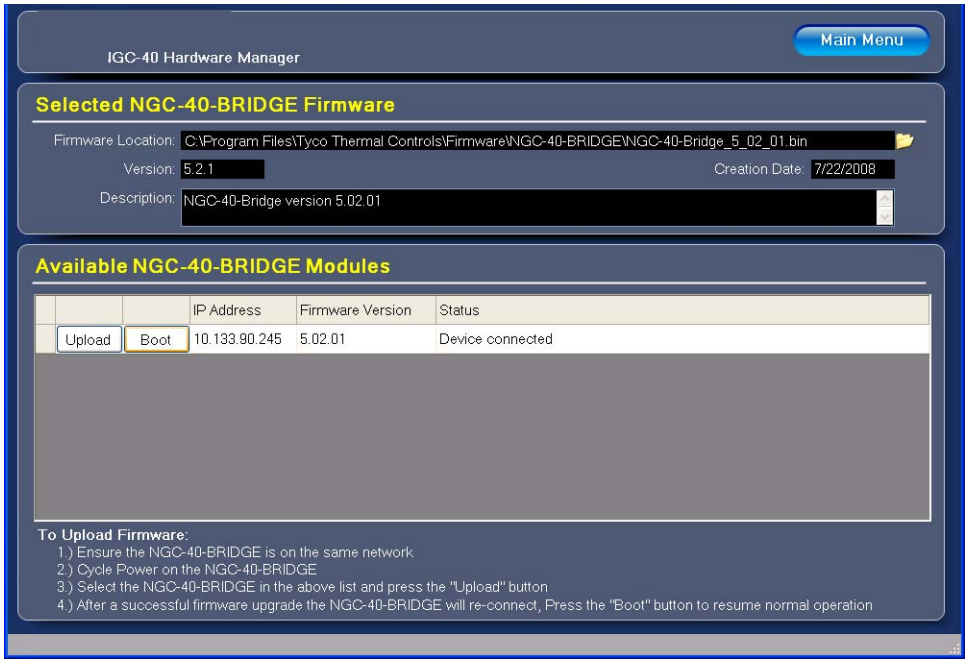
As described in Section 3.2, you will need to ensure your computer is on the same network as the NGC-40-BRIDGE. The IP addresses for both devices need to have the same first 3 sets of numbers. (i.e. 192.168.1.XXX) ,

Step 2 – Cycle Power on the NGC-40-BRIDGE

To cycle power on the NGC-40-BRIDGE either press the RESET button on the top right using the end of a paperclip, or disconnect the CAN cable then reconnect it.



After cycling power in the NGC-40-BRIDGE, it will show up in the list.


IGC-40 Hardware Manager
Main Menu
Selected NGC-40-BRIDGE Firmware
Firmware Location: C:\Program Files\Tyco Thermal Controls\Firmware\NGC-40-BRIDGE\NGC-40-Bridge_5_02_01.bin
Version: 5.2.1
Creation Date: 7/22/2008
Description: NGC-40-Bridge version 5.02.01
Available NGC-40-BRIDGE Modules
IP Address
Firmware Version
Status
Upload
Boot
10.133.90.245
5.02.01
Device connected
To Upload Firmware:
1.) Ensure the NGC-40-BRIDGE is on the same network
2.) Cycle Power on the NGC-40-BRIDGE
3.) Select the NGC-40-BRIDGE in the above list and press the "Upload" button
4.) After a successful firmware upgrade the NGC-40-BRIDGE will re-connect, Press the "Boot" button to resume normal operation

IP Address - shows the current IP address for that NGC-40-BRIDGE.

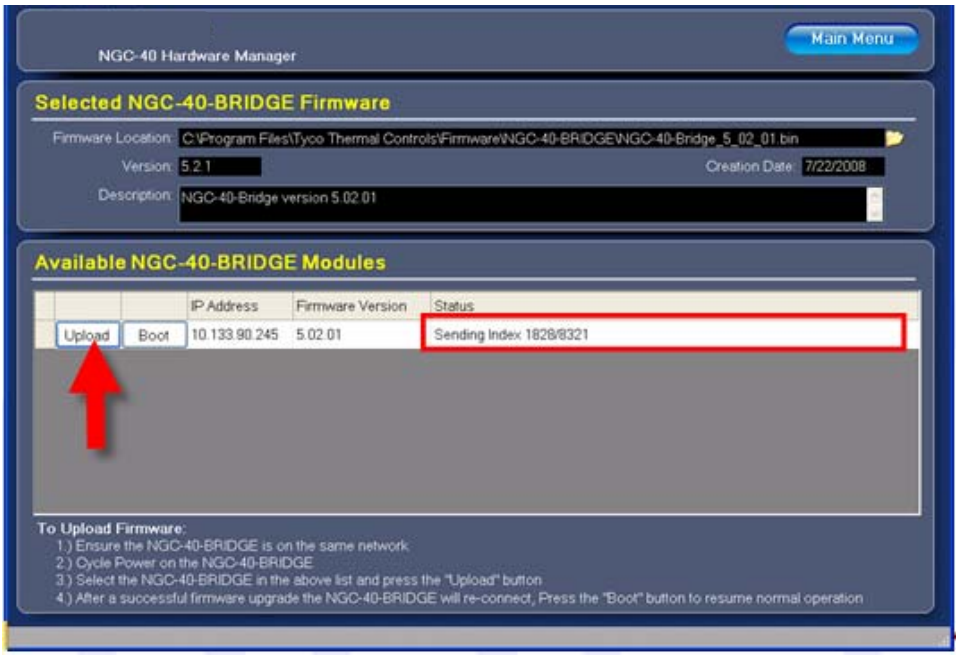
Firmware Version - shows the version currently installed in the NGC-40-BRIDGE. If the version appears as 0.0.0 the NGC-40-BRIDGE may be on a different network than the computer. Check the IP Address.

Status - shows the current status. When connected to a NGC-40-BRIDGE on the same network the status is "Device connected". On

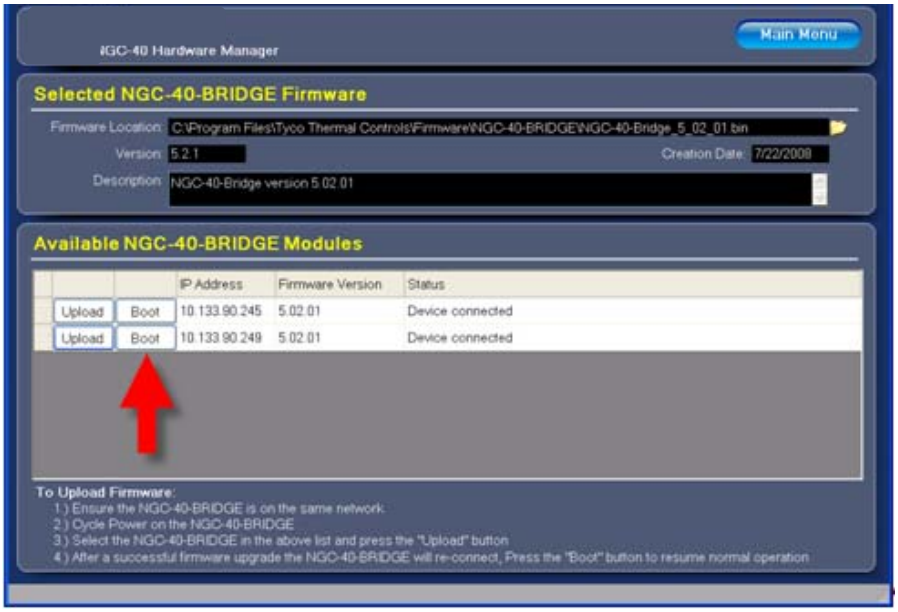
a different network it may say “Bridge Found”. As the firmware is being uploaded the status field will show the progress.

Step 3 – Select the NGC-40-BRIDGE in the above list and press the “Upload” Button

The status of the upload is shown in the status field.


NGC-40 Hardware Manager
Main Menu
Selected NGC-40-BRIDGE Firmware
Firmware Location: C:\Program Files\Tyco Thermal Controls\Firmware\NGC-40-BRIDGE\NGC-40-Bridge_5_02_01.bin
Version: 5.2.1
Creation Date: 7/22/2008
Description: NGC-40-Bridge version 5.02.01
Available NGC-40-BRIDGE Modules
IP Address
Firmware Version
Status
Upload
Boot
10.133.90.245
5.02.01
Sending Index 1828/8321
To Upload Firmware:
1.) Ensure the NGC-40-BRIDGE is on the same network
2.) Cycle Power on the NGC-40-BRIDGE
3.) Select the NGC-40-BRIDGE in the above list and press the "Upload" button
4.) After a successful firmware upgrade the NGC-40-BRIDGE will re-connect, Press the "Boot" button to resume normal operation

Step 4 – After a successful firmware upgrade the NGC-40-BRIDGE will re-connect, Press the “Boot” button to resume normal operation



After the "Boot" command is sent, the firmware upload is complete. Select "Main Menu" to exit to the main menu screen. You can verify the firmware by connecting to the NGC-40-BRIDGE again via RS-232 or Ethernet.

4.3 Uploading Firmware to Multiple NGC-40-BRIDGE Modules

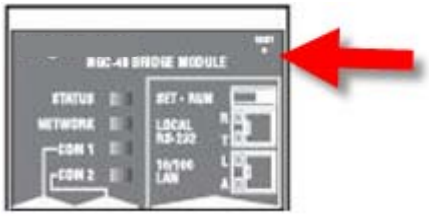
There may be times where several NGC-40-BRIDGE modules are in close proximity and all need to be updated. The update procedure is the same as outlined above for each of the NGC-40-BRIDGE modules

Step 1 – Ensure the NGC-40-BRIDGEs are on the same network

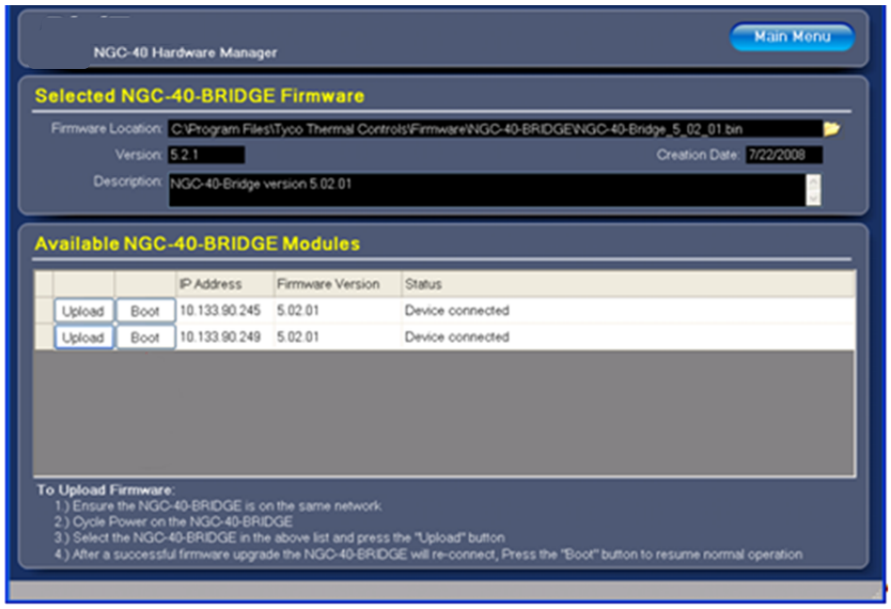
As described in Section 3.2, you will need to ensure your computer is on the same network as the NGC-40-BRIDGE. The IP addresses for all devices need to have the same first 3 sets of numbers. (i.e. 192.168.1.XXX) ,

Step 2 – Cycle Power on the NGC-40-BRIDGE

To cycle power on the NGC-40-BRIDGE either press the RESET button on the top right using the end of a paperclip, or disconnect the CAN cable then reconnect it. This will need to be done for each NGC-40-BRIDGE you wish to update.

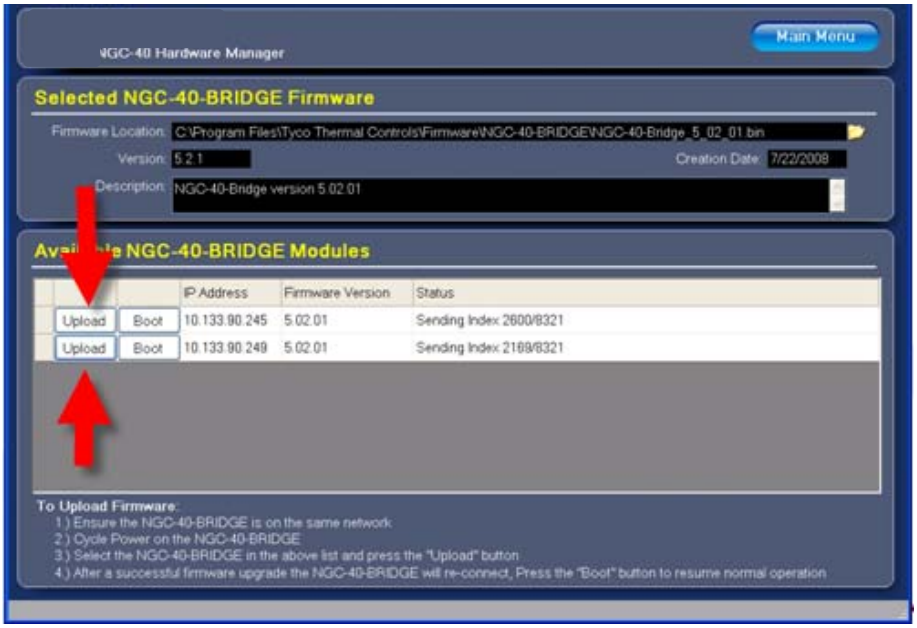


After cycling power in the NGC-40-BRIDGE, it will show up in the list.



Step 3 – Select the NGC-40-BRIDGE in the above list and press the "Upload" Button

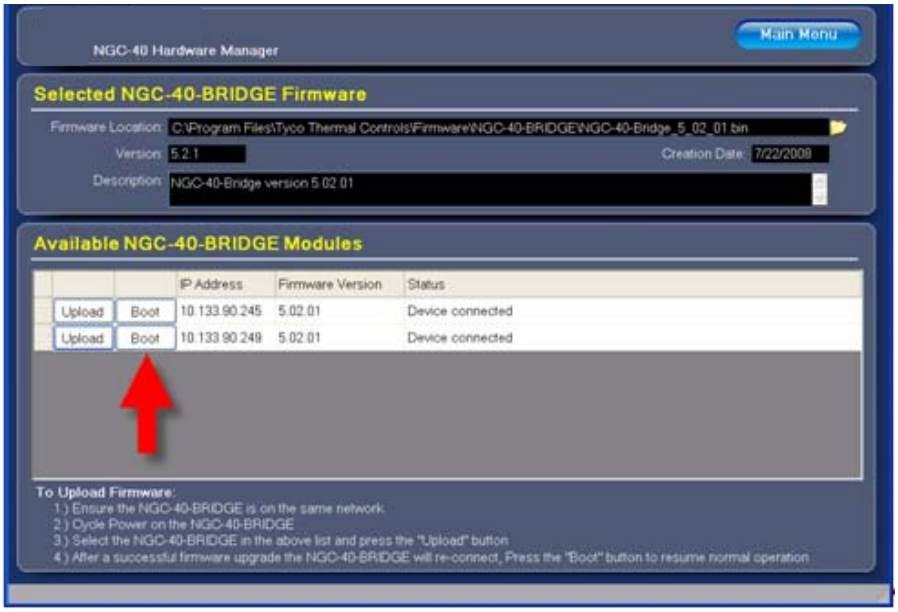
Select "Upload" for the first NGC-40-BRIDGE; the status bar will show the upload process. Select "Upload" for each successive NGC-40-BRIDGE in the list; all NGC-40-BRIDGE modules will now be uploading simultaneously.



After a successful upload, the NGC-40-BRIDGE will briefly show a status of UPDATE_SUCCESS. Then it will appear as before, with the Firmware Version now showing the new version number.

Step 4 – After a successful firmware upgrade the NGC-40-BRIDGE will re-connect, Press the "Boot" button to resume normal operation

To resume normal operation of the NGC-40-BRIDGE, select the Boot button beside it.



Once the NGC-40-BRIDGE has been booted it disappears from the list, and when the list is clear you can return to the main menu by selecting the Main Menu button.

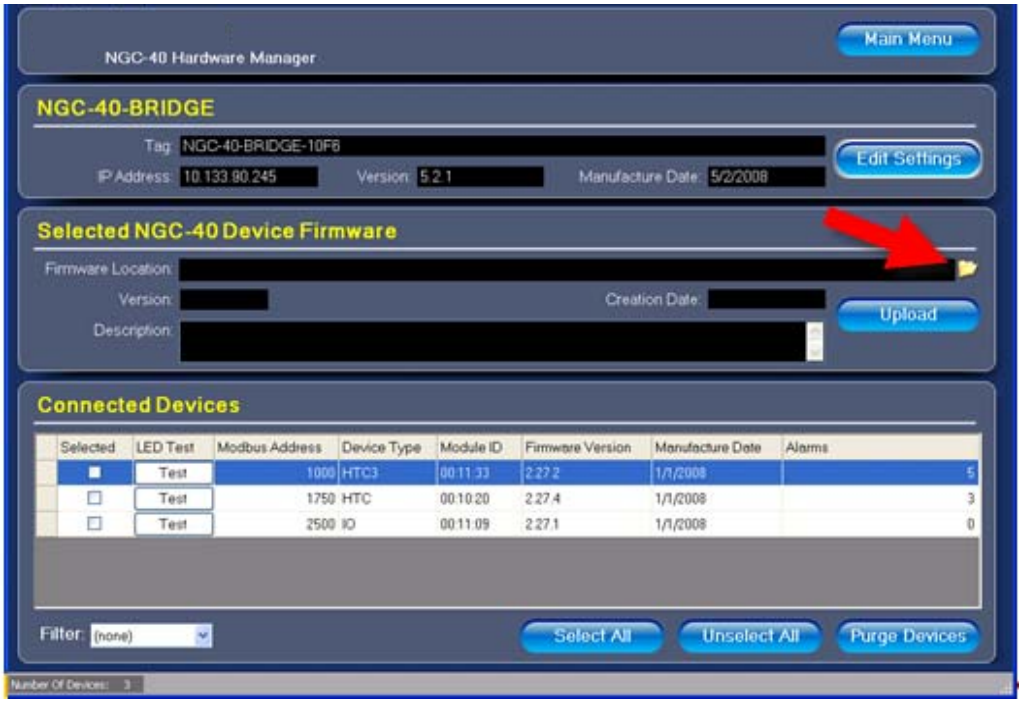
4.4 Upload Firmware to an NGC-40-Module

IMPORTANT – This process can only be performed when you connect to the NGC-40-BRIDGE via Ethernet.

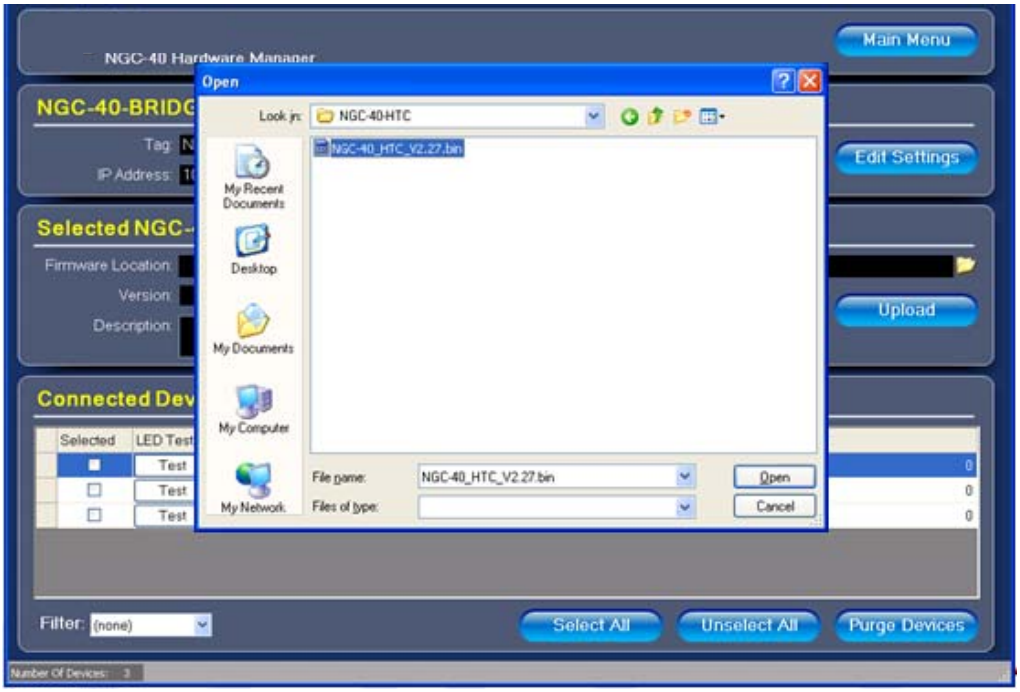
During the firmware upgrade process, the NGC-40 modules will not be in their normal operating state and depending on the upgrade may go to Factory Default configurations. It is recommended to back up the configuration parameters prior to a firmware upgrade via Raychem Supervisor.

To load firmware into the NGC-40 devices, connect to the NGC-40-BRIDGE using the Ethernet connection. For more information on this process, consult Section 3.2.

Once you are connected, you will need to first select the firmware file. Select the folder icon, shown below, and choose from the popup menu.

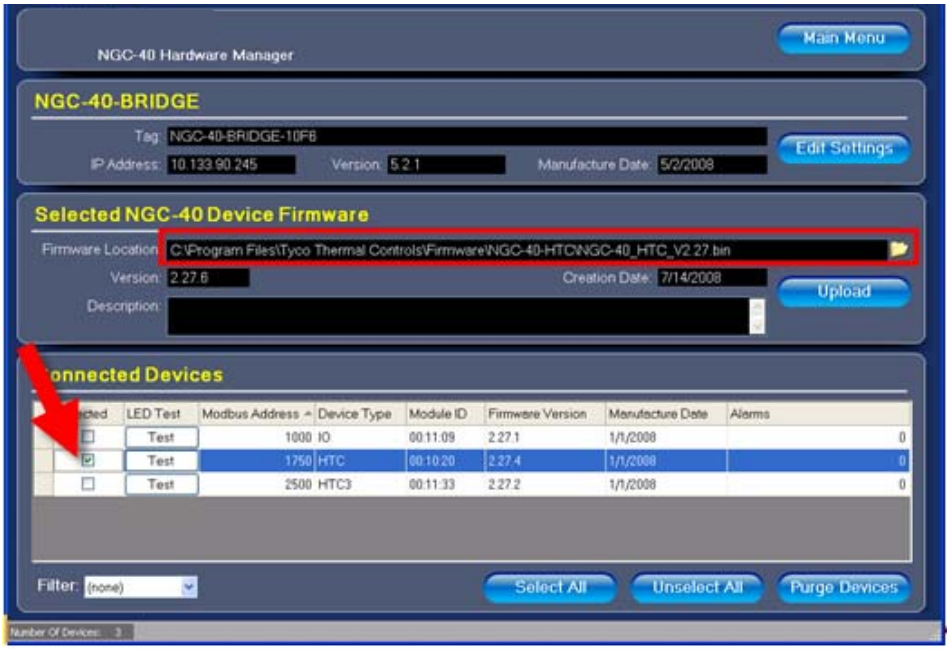


Select the appropriate file for the NGC-40 module type you wish to update. Each NGC-40 module type will need to be updated separately.

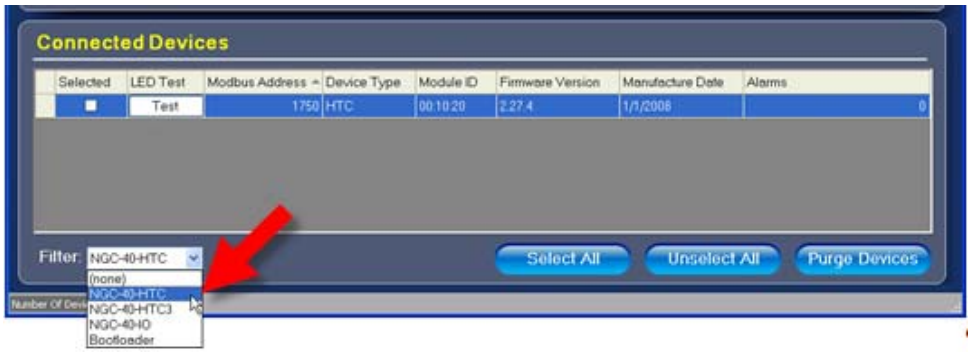


After you have selected the file it will show up in the Firmware Location bar. The other boxes will now be filled in as well. The Version box shows the firmware version selected, and the Creation Date is the day that firmware was created. The Description box may also include a brief description of the firmware.

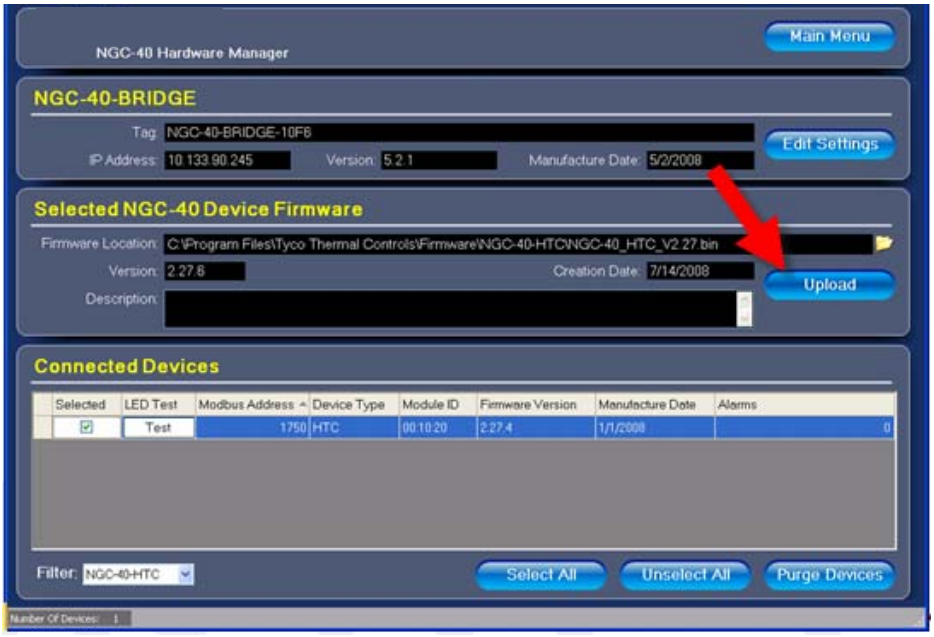
Now, select the correct type of controller to upload to by clicking on the box to the left of the list. In this example, an NGC-40-HTC was selected.



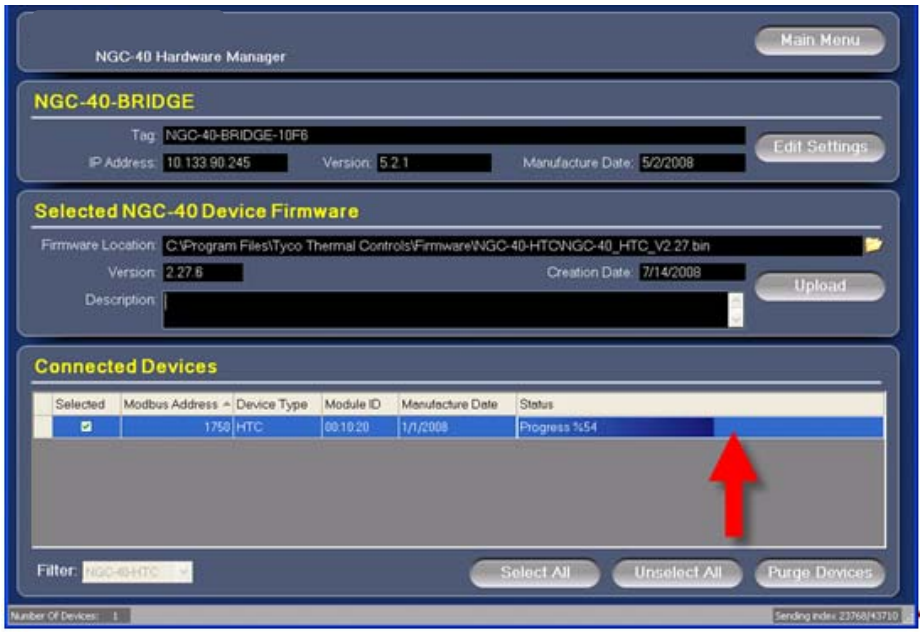
It may be easier to filter by module type using the filter box in the bottom left corner.



Once you have selected all the modules you want to upload firmware to, press the Upload button. The upload will then begin.



The status bar displays the progress of the upload.

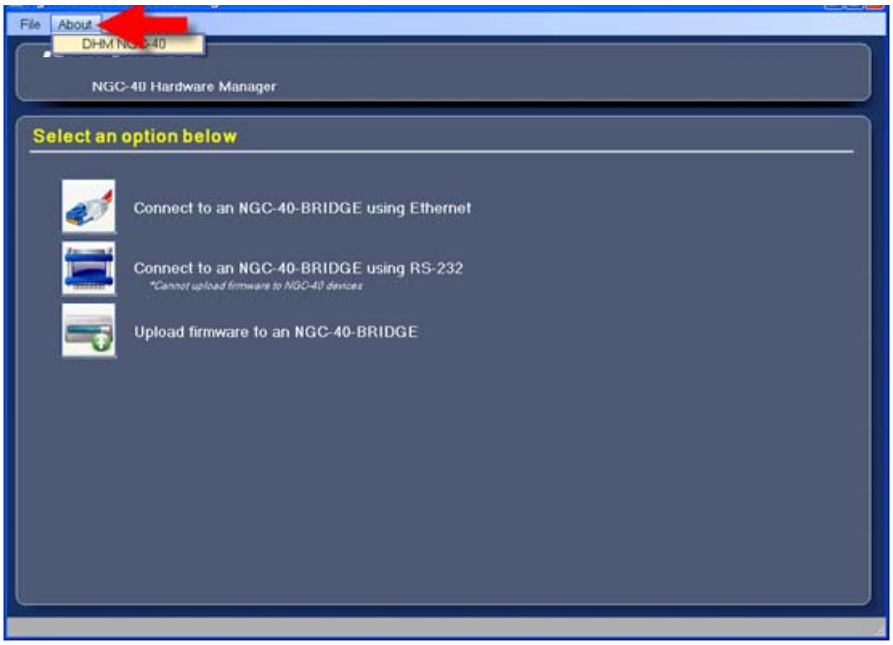


Once the upload is complete, the module appears in the list as before, with the updated firmware version number.

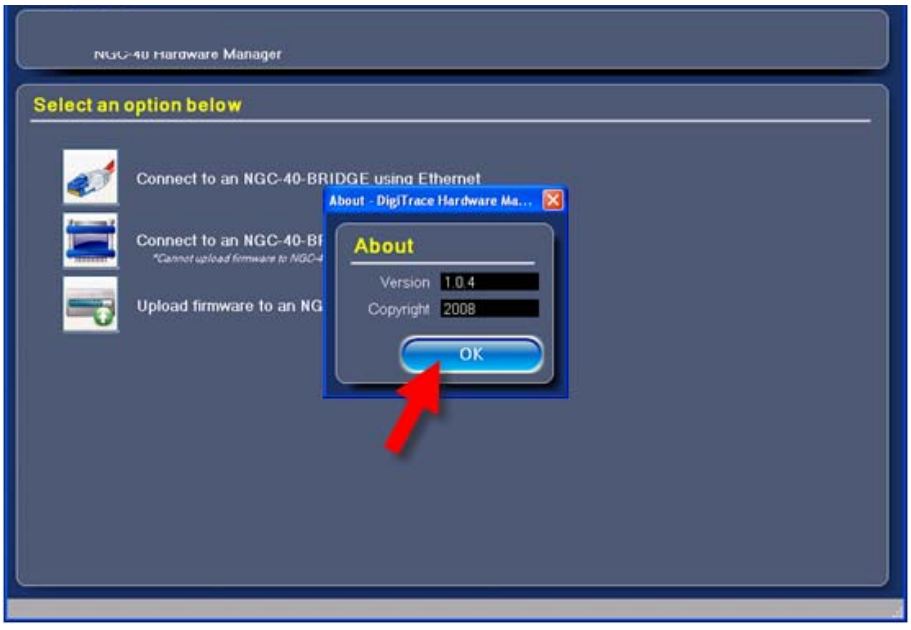
Repeat the above steps for all of the module types you would like to update.

Section – 5 ABOUT SCREEN

The "About" screen gives you the version number of the DHM that you currently have installed. To view the about screen, select About from the main screen, then DHM NGC-40



The About screen will appear, showing the version number and copyright information. Exit this screen by selecting the OK button.



PENTAIR

WWW.PENTAIRTHERMAL.COM

NORTH AMERICA

Tel: +1.800.545.6258
Fax: +1.800.527.5703
Tel: +1.650.216.1526
Fax: +1.650.474.7711
thermal.info@pentair.com

EUROPE, MIDDLE EAST, AFRICA

Tel: +32.16.213.511
Fax: +32.16.213.603
thermal.info@pentair.com

ASIA PACIFIC

Tel: +86.21.2412.1688
Fax: +86.21.5426.2937
cn.thermal.info@pentair.com

LATIN AMERICA

Tel: +1.713.868.4800
Fax: +1.713.868.2333
thermal.info@pentair.com

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